GENERAL DESCRIPTION

The High Plains aquifer in Oklahoma is part of a regional aquifer system extending from South Dakota on the north through Wyoming, Colorado, Nebraska, Kansas, and Oklahoma to Texas and New Mexico on the south (index map). The principal aquifer, the Ogallala Formation of Tertiary age, is hydraulically connected with other unconsolidated deposits, principally of Quaternary age. Alluvium and terrace deposits in hydrologic continuity with the Ogallala are included in the High Plains aquifer in Oklahoma. Parts of the underlying bedrock also are hydraulically connected with the Ogallala. The High Plains aquifer in Oklahoma has eroded on the west to expose rocks of Cretaceous age and on the east to expose rocks of Permian age.

During 1978, the U.S. Geological Survey began a 5-year study of the High Plains regional aquifer system to provide hydrologic information for evaluation of the effects of long-term development of the aquifer and to develop computer models for prediction of aquifer response to alternative changes in ground-water management (Weeks, 1978). This report is one of a series presenting hydrologic information on the High Plains aquifer in Oklahoma.

This report consists of two maps showing the altitude and configuration of the eroded pre-Ogallala bedrock surface (sheets 1 and 2) that forms the base of the aquifer. Bedrock slopes generally from west to east and is composed of rocks of Permian, Triassic-Jurassic, and Cretaceous age. The subcrop extent of these rocks is shown by Morton (1973) for Oklahoma and by Weeks and Gutentag (1981) for the entire High Plains study area. Altitudes of the aquifer base were determined from drillers' logs provided by the Oklahoma Water Resources Board and from published and unpublished information in the files of the U.S. Geological Survey. Where data were sparse, the total well depth was used as the aquifer base under the assumption that wells generally are not drilled very deep into non-water yielding bedrock.

Closed depressions in north-central and northeast Beaver County (sheet 2) probably are related to deep-seated solution of Permian salt and anhydrite and subsequent collapse of overlying beds (Frye and Schoff, 1942).

CONVERSION TABLE

The inch-pound units of measurements given in this report are listed with equivalent International System (SI) of Units using the following conversion factors:

Inch-pound unit	Multiply by	SI (metric) unit
foot	0.3048	meter
mile	1.609	kilometer

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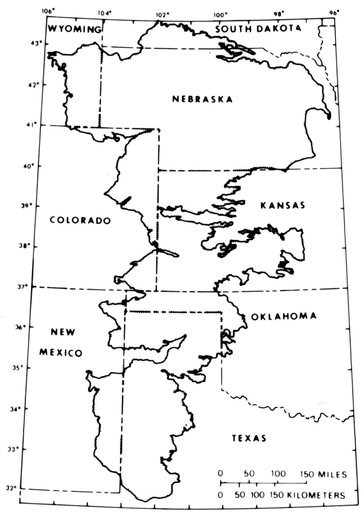
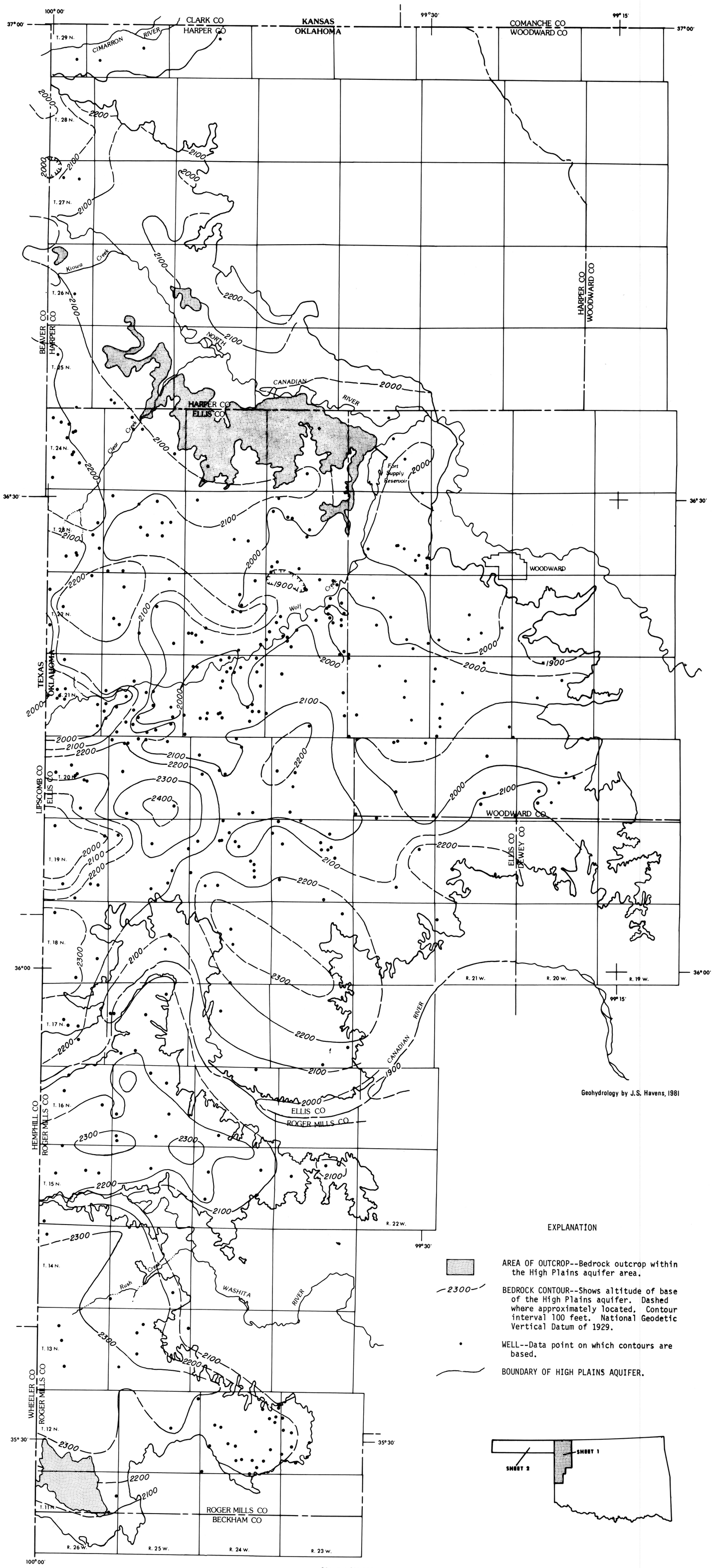


Index map showing location of the High Plains aquifer (shaded)



Geohydrology by J.S. Havens, 1981

Base from U.S. Geological Survey
Clinton 1:250,000, 1955 and
Woodward 1:250,000, 1955

SCALE 1:250 000
5 0 5 10 15 20 MILES
5 0 5 10 15 20 25 30 KILOMETERS

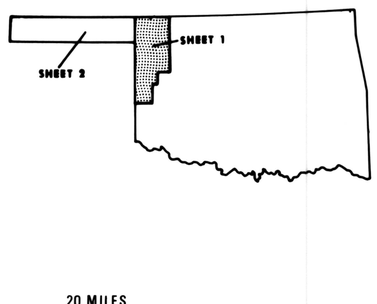
EXPLANATION

AREA OF OUTCROP--Bedrock outcrop within the High Plains aquifer area.

2300 BEDROCK CONTOUR--Shows altitude of base of the High Plains aquifer. Dashed where approximately located. Contour interval 100 feet. National Geodetic Vertical Datum of 1929.

WELL--Data point on which contours are based.

BOUNDARY OF HIGH PLAINS AQUIFER.



MAP SHOWING ALTITUDE AND CONFIGURATION OF THE BASE OF THE HIGH PLAINS REGIONAL AQUIFER IN HARPER, ELLIS, WOODWARD, DEWEY, AND ROGER MILLS COUNTIES, OKLAHOMA

GENERALIZED ALTITUDE AND CONFIGURATION OF THE BASE OF THE HIGH PLAINS REGIONAL AQUIFER, NORTHWESTERN OKLAHOMA

By
John S. Havens

1981